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THE VARIATION AND TRANSGRESSIVE SEGREGATION IN WIDE AND VARIETAL CROSSES OF MUNGBEAN

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ABSTRACT

High mean and large variance were exhibited in the F_2 generation of T 44 x PLN 15 for yield per plant, seeds per pod and pods per plant, in ML 5 x LM 293 (BC_1 F_2) for pods per plant and in T 44 x ML 5 (F_2) for days to first flower. The F_2 generation of T 44 x PLN 15 showed transgression for seeds per pod and yield per plant and pods per plant. ML 5 x LM 293 (BC_1 F_2) exhibited transgression for pods per plant and yield per plant. ML 5 x LM 293 (F_2) and T 44 x ML 5 (BC_2 F_2) expressed significantly higher transgressives for days to first flower and seed weight respectively.

KEY WORDS: Mungbean, Transgressive segregation, Intra- and Interspecific cross derivatives.

Mungbean is one of the most important grain legumes and is widely cultivated in different seasons in India. However, the average yield is very low. To improve yield, the breeding strategy aims at creating sufficient variability for characters of economic importance either by attempting intra and interspecific crosses. Intergression of germplasm from wild relative to cultivated types is one of the important ways to create variability for qualitative and quantitative characters. The present investigation was therefore taken up on the F_2, BC_1F_2 and BC_2F_2 of one wide and two varietal crosses.

MATERIALS AND METHODS

The experimental material consisted of three cultivated lines of greengram and one strain of Vigna radiata var. sublobata (PLN 15). T-44 was crossed with PLN-15 to get a wide cross. Two varietal crosses viz., T-44 x ML-5 and ML-5 x LM 293 were also made. The F_1 plants were also backcrossed to T-44 and ML-5 to get BC_1

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Table. Variation and percentage of transgressives in the F_2, BC_1F_2 and BC_2F_2 generations of greengram for yield and yield contributing characters

Character/ Parameter		Crosses								
		T 44 x ML 5			ML 5 x LM 293			T 44 x PLN 15		
		F_2	BC_1F_2	BC_2F_2	F_2	BC_1F_2	BC_2F_2	F_2	BC_1F_2	BC_2F_2
Days to	Mean	45.84	43.13	42.53	41.60	44.00	43.41	44.54	42.66	41.88
first	variance	9.03	3.08	0.57	2.73	3.55	2.31	2.57	0.69	0.72
flower	TS	8	9	2	26	2	2	2	2	16
	STS	2	0	0	17	2	1	1	1	5
Pods/	Mean	56.18	54.58	54.74	58.43	62.65	55.95	67.81	57.53	58.57
plant	Variance	494.48	636.08	550.84	693.41	873.41	592.96	971.34	721.71	790.03
	TS	24	24	27	26	37	25	35	34	31
	STS	5	9	13	17	23	18	27	19	17
Seeds/	Mean	11.17	10.94	11.41	11.15	11.18	11.38	11.11	11.19	10.67
pod	Variance	2.07	1.73	1.62	0.80	1.90	1.52	2.52	1.18	2.15
	TS	22	22	35	21	27	29	39	33	30
	STS	0	1	2	1	3	7	2	2	1
Hundred	Mean	2.20	2.75	3.96	2.62	2.21	2.54	2.78	3.07	2.85
seed	Variance	0.49	0.56	1.84	0.41	0.51	0.48	0.27	0.35	0.36
weight(g)	TS	11	28	32	18	20	24	29	36	38
	STS	1	1	17	1	2	2	2	3	5
Yield/	Mean	11.68	12.10	12.38	10.57	12.07	10.83	15.38	13.48	13.23
plant (g)	Variance	24.25	30.87	29.39	15.36	33.19	16.93	54.17	39.91	34.31
	TS	26	28	31	16	26	24	42	37	33
	STS	21	21	20	6	22	16	21	17	13

TS - Transgressive segregates STS - Significantly transgressive segregates

generation. The BC_1F_1 plants were again backcrossed to get BC_2F_1 seeds. The F_1, B_1CF_1 and BC_2F_1 seeds were multiplied to get F_2, BC_1F_2 and BC_2F_2 seed respectively. The F_2, BC_1F_2 and BC_2F_2 were grown in Kharif season of 1985 in randomized block design with three replications in four row plots of 5 m. length. The plant to plant distance was 10 cm and inter-row distance was 60 cm. Observations were recorded on ten randomly selected competitive plants from two central rows. Percentage of transgressive segregates in F_2, BC_1F_2 and BC_2F_2 derived lines were made by defining extreme progeny types as transgressive (i.e. the lines that exceeded their better parent mean) or significantly transgressive (i.e. the lines that exceeded their better parent mean at LSD 0.05 probability.

RESULTS AND DISCUSSION

The analysis of variance revealed that the differences among the treatments were highly significant for all the characters. The mean, variance and transgressive segregates in different crosses are presented in Table.

The F_2 population T-44 x PLN-15 manifested high mean and large variance for pods per plant, seeds per pod and yield per plant. The F_2 population of this cross also recorded significantly higher transgressives for pods per plant and yield per plant.

The BC_2F_2 population of ML-5 x LM 293 varietal cross exhibited high mean and large variance for seeds per pod. The BC_2F_2 population of the same cross also manifested significantly high transgressives for seeds per pod. The F_2 population of ML 5 x LM 293 showed significantly more transgressive for days to first flower. The BC_1F_2 population of varietal cross ML 5 x LM 293 expressed high mean and large variance for pods per plant. Higher transgressives for pods per plant and significantly higher transgressives for yield per plant were noted in the BC_1F_2 population of ML 5 x LM 293. The BC_2F_2 population of T-44 x ML-5 varietal cross manifested high mean and large variance for seed weight and also expressed significantly higher transgressives for this character. Parida (1982) also observed high mean and large variance for pods per plant and seed weight in the F_2 population of the varietal cross.

It was observed that the F_2 population of the wide cross T-44 x PLN-15 had high mean and large variance for important yield components and yield per se. The F_2 generation of the same cross also manifested higher transgressives for seeds per pod and yield per plant and significantly higher transgressives for pods per plant.

Higher variance coupled with higher transgressives were observed in the F_2 generation of wide cross T-44 x PLN-15 and in the BC_1F_2 generation of varietal crosses T 44 x ML 5 and ML 5 x LM 293. Hence, these crosses were selected for their respective characters for further exploitation.

REFERENCES

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